



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/788,453	03/01/2004	Naoko Ikegaya	566.43577X00	7377

24956 7590 01/27/2006

MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C.  
1800 DIAGONAL ROAD  
SUITE 370  
ALEXANDRIA, VA 22314

EXAMINER

MCFADDEN, MICHAEL B

ART UNIT PAPER NUMBER

2188

DATE MAILED: 01/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/788,453

Applicant(s)

IKEGAYA ET AL.

Examiner

Michael B. McFadden

Art Unit

2188

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 01 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 13-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 13-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

1. Claims 1-12 are cancelled.
2. Claims 13-24 are pending.

### ***Oath/Declaration***

3. The oath/declaration submitted on June 6<sup>th</sup>, 2004 is deemed acceptable by the Examiner.

### ***Drawings***

4. The drawings submitted on March 1<sup>st</sup>, 2004 are deemed acceptable by the Examiner.

### ***Abstract***

5. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Art Unit: 2188

6. The abstract of the disclosure is objected to because it is not limited to a single paragraph. Correction is required. See MPEP § 608.01(b).

***Specification***

7. The disclosure is objected to because of the following informalities:
- a. On lines 50-53, the sentence, "Further, to enhance integrity against disaster such as an earthquake, it is favorable that remote storages are located at remoter places as far as possible," does not read clearly. The Examiner suggests, "Further, to enhance integrity against disaster such as an earthquake, it is favorable that remote storages are located at remoter places as far **away** as possible."
- Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

8. The following is a quotation of the first paragraph of 35 U.S.C. 112:
- The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.
9. Claim 23 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had

Art Unit: 2188

possession of the claimed invention. In claim 23, on line 5, "an arithmetic unit" is claimed, and nowhere in the specification or drawings is an arithmetic unit disclosed.

For purposes of examination the Examiner will ignore this limitation.

***Claim Rejections - 35 USC ' 102***

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

11. Claims 13, 19, 20, and 23 are rejected under 35 U.S.C. 102(e) as being anticipated by LeCrone (U.S. Patent No. 6,529,944).

12. **As per claim 13**, LeCrone discloses a computer system which includes a plurality of storage subsystems being sequentially concatenated to a host computer, and which performs remote copy between said storage subsystems (**See Figure 1, Elements 2, SYMM2, SYMM5, and SYMM6 also See Column 1, Lines 26-30**),

A first storage subsystem comprising:

An interface which receives a status information acquisition command and which sends status information from the first storage subsystem to a second storage subsystem that is located on a nearer side of the first storage subsystem relative to the host computer and connected to the first storage subsystem;

An outgoing status information storage unit which stores said status information to be sent to said second storage subsystem;

A target storage subsystem judgment unit which judges whether a target storage subsystem identified in the status information acquisition command received by said interface is the first storage subsystem.

A command downstream sending unit which sends said status information acquisition command to a third storage subsystem that is located on a farther side of the first storage subsystem relative to the host computer and connected to the first storage subsystem, when said target storage subsystem judgment unit judges that the first storage subsystem is not said target storage subsystem from which said status information is to be acquired;

A self status information acquisition unit which acquires the status information of the first storage subsystem and which stores the acquired status information to be sent to the second storage subsystem into said outgoing status information storage unit, when said target storage subsystem judgment unit judges that the first storage subsystem is said target storage subsystem from which said status information is to be acquired, and

A downstream status information acquisition unit which receives the status information from said third storage subsystem and which stores the received status information to be sent to the second storage into said outgoing status information storage unit,

Wherein, after said self status information acquisition unit or said downstream status information acquisition unit stores said status information into said outgoing status information storage unit, said interface sends said status information stored.

**Regarding the claim see Column 8, Lines 40-47. This teaches that the host (Fig.1, element 2) has the capability to determine the status of any device anywhere in the stream. Also it states that the commands can be sent downstream to take effect one or two or more SRDF locations away. In order for this to occur each unit must contain an interface, which receives the status acquisition command and sends it back upstream to the unit next in line. There also must be an outgoing status information storage unit, which stores the status information that will be sent.**

**A target storage subsystem judgment unit must also be present because the host is able to select which system's status is being acquired. (See Column 9, Lines 9-12) In order to identify itself using that query the judgment unit must be present.**

**A command downstream sending must also be present in order to send the commands from the host downstream.**

**A self status information acquisition unit must be present if the systems (Fig.1, Element SYMM2, SYMM5, SYMM6) are able to inform the host of their status information. A downstream status information sending unit must also be present in order to receive the information being sent from downstream systems.**

**The information clearly is sent along the chain and reporting back to the host the requested status information.**

13. **As per claim 19**, LeCrone discloses a computer system comprising:

A host computer (**Figure 1, Element 2**),

A plurality of storage subsystems which are sequentially concatenated to said host computer and remote copy is performed between said plurality of storage subsystems (**Figure 1, Element SYMM2, SYMM5, SYMM6**),

Wherein a first storage subsystem comprising:

An interface which receives status information acquisition command and which sends status information to a second storage subsystem that is located on a nearer side of the first storage subsystem relative to the host computer and connected to the first storage subsystem,

An outgoing status information storage unit which stores said status information to be sent to said second storage subsystem,

A target storage subsystem judgment unit which judges whether a target storage subsystem identified in the status information acquisition command received through said interface is the first storage subsystem,

A command downstream sending unit which sends said status information acquisition command to a third storage subsystem that is located on a farther side of first storage subsystem relative to the host computer and connected to first storage subsystem, when said target storage subsystem judgment unit judges that



Art Unit: 2188

the first storage subsystem is not said target storage subsystem from which said status information is to be acquired,

A self status information acquisition unit which acquires the status information of the storage subsystem and which stores the acquired status information to be sent to the second storage subsystem into said ongoing status information storage unit, when said target storage subsystem judgment unit judges that the first storage subsystem is said target storage subsystem from which said status information is to be acquired, and

A downstream status information acquisition unit which receives the status information from said third storage subsystem and which stores the received status information to be sent to the second storage into said outgoing status information storage unit,

wherein after said self status information acquisition unit or said downstream status information acquisition unit stores said status information into said outgoing status information storage unit, said interface sends said status information stored in said outgoing status information storage unit,

Wherein said host computer comprises:

A status information acquisition command generation unit which generates said status information acquisition command,

A status information acquisition unit which receives status information from said plurality of storage subsystems, and

A remote copy adjustment unit which generates information for adjusting a remote copy according to said status information held in said status information holding unit.

**This claim is rejected using the same rationale as Claim 13. Further including that the host unit would require a status information acquisition command generation unit in order to send status requests to the backup units. Also a status information acquisition unit which receives status information would be necessary for the host to receive the status information sent from the backup units.**

**In column 8, lines 34-47 LeCrone talks about the host having the ability to send a command downstream that can have a changing effect on one of the systems. If the target reports that it is idle in the status information that the host requests, the host can then send a command to the unit. Thereby using the status information to send an adjustment.**

14. **Claim 20** is rejected using the same rationale as Claim 13.

15. **Claim 23** is rejected using the same rationale as Claim 13.

***Claim Rejections - 35 USC ' 103***

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

17. Claims 14, 15, 16, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over LeCrone (U.S. Patent No. 6,529,944) as applied to claim 13 above, and further in view of Reichbauer et al. (herein Reichbauer (U.S. Patent No. 4,881,074)).

18. **As per claim 14**, LeCrone fails to disclose a concatenation position judgment unit which judges a concatenation position of the first storage subsystem based on information stored in said status information acquisition command received from said upstream storage subsystem,

Wherein when said concatenation position judgment unit judges that the first storage subsystem is a storage connected to said host computer, then, said interface sends the status information stored in said status information storage unit to said host computer.

Reichbauer discloses a concatenation position judgment unit which judges a concatenation position of the first storage subsystem based on information stored in said status information acquisition command received from said upstream storage subsystem,

Wherein when said concatenation position judgment unit judges that the first storage subsystem is a storage connected to said host computer, then, said interface sends the status information stored in said status information storage unit to said host computer.

In column 1, lines 36-45 and column 9, lines 31-51 in Reichbauer a method for acquiring and distributing an address table containing address information of all of the nodes. The sequence of the addresses specifies the sequence or the position of the station in the network. The table can then be distributed with the status request in the network of LeCrone. The table can then be used to determine what position a storage system is in the network.

The storage system would be able to tell if it were directly connected to the host. Providing the address table would establish another method for the storage system to determine if it is connected to the host. If the storage system is directly connected to the host computer it has no choice when sending status information except to send it to the host.

LeCrone and Reichbauer are analogous art because they are from the same field of endeavor, communication networks.

At the time of invention it would have been obvious to a person of ordinary skill in the art to take the address table collection and distribution method and use it in the network of LeCrone.

The motivation for doing so would have been to provide tabular information in an economical manner (**Column 1, Lines 36-45**).

Therefore, it would have been obvious to combine the address table collection and distribution method of Reichbauer with the network of LeCrone for the benefit of providing tabular information in an economical manner to obtain the invention as specified in claims 14, 15, 16, and 21.

19. **As per claim 15**, LeCrone in view of Reichbauer disclose a first storage subsystem according to Claim 14, wherein when said target storage subsystem judgment unit judges that said target storage subsystem is all of said plurality of storage subsystems including the storage subsystem sequentially concatenated from said host computer, and said concatenation position judgment unit judges that the first storage subsystem is not a storage subsystem concatenated at a farthest position relative to said host computer among said plurality of storage subsystems sequentially concatenated, then, said command downstream sending unit sends said status information acquisition command to the third storage subsystem connected to the storage subsystem,

Wherein said self status information acquisition unit adds the acquired status information of the first storage subsystem to the status information that is received by said downstream status information acquisition unit from said third storage subsystem and stored in said outgoing status information storage unit, and then, said self status information acquisition unit stores resultant status information to be sent to the second storage into said outgoing status information storage unit, and wherein after said self status information acquisition unit stores said status information into said outgoing status information storage unit, said interface sends said status information.

**LeCrone shows that there is an 'ALL' command associated with the query request. (See Column 9, Lines 9-12 of LeCrone) The request specifies a path and ends in all, which signifies requesting the status information of all**

**systems at that path. LeCrone also teaches that the path portion of the query command is optional. (Column 9, Lines 5-8) If the host were to issue a query command with no path and 'ALL' then it requests the status information of all of the storage systems. If a system gets the request it will not only acquire its own status information, but it will also send the request downstream to the units farther down the line. When the unit receives the status information from the downstream unit it would also include its status information having been requested by the 'ALL' request.**

**For the motivation to combine see the rejection of claim 14**

20. **As per claim 16**, LeCrone in view of Reichbauer disclose a storage subsystem according to Claim 15, wherein when said target storage subsystem judgment unit judges that said target storage subsystem is all of said plurality of storage subsystems including the storage subsystem sequentially concatenated from said host computer, and said concatenation position judgment unit judges that the first storage subsystem is not the storage subsystem concatenated at a farthest position seen from said host computer among said plurality of storage subsystems sequentially concatenated, then, said command downstream sending unit instructs said self status information acquisition unit to acquire the status information of the first storage subsystem and to store the acquired status information to be sent to the second storage into said outgoing status information storage unit.

**Claim 16 is rejected using the same rationale as claims 14 and 15. If the 'ALL' command is utilized then each storage system will acquire its status information and prepare to send it upstream.**

21. **Claim 21 is rejected using the same rationale as Claim 15.**
22. Claims 17, 18, 22, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over LeCrone (U.S. Patent No. 6,529,944) as applied to claim 1 above, further in view of Reichbauer et al. (herein Reichbauer (U.S. Patent No. 4,881,074)) as applied to claim 16 above, and further in view of Inamine (U.S. Patent No. 6, 196, 735).
23. **As per claim 17**, LeCrone in Reichbauer fail to disclose a storage subsystem according to Claim 16, further comprising:

An acquired information judgment unit, which judges whether status information whose acquisition is requested by the status information acquisition command received, is newest status information,

Wherein when said acquired information judgment unit judges that the newest status information is not requested, said concatenation position judgment unit judges that the first storage subsystem is a storage subsystem, and said outgoing status information storage unit holds the status information, then, said interface sends the held status information to the host computer without waiting for said self status information acquisition unit or said downstream status information acquisition unit to store status information into said outgoing status information storage unit.

Inamine discloses a storage subsystem according to Claim 16, further comprising:

An acquired information judgment unit, which judges whether status information whose acquisition is requested by the status information acquisition command received, is newest status information,

Wherein when said acquired information judgment unit judges that the newest status information is not requested, said concatenation position judgment unit judges that the first storage subsystem is a storage subsystem, and said outgoing status information storage unit holds the status information, then, said interface sends the held status information to the host computer without waiting for said self status information acquisition unit or said downstream status information acquisition unit to store status information into said outgoing status information storage unit.

**Inamine (Column 5, Line 64 – Column 6, Line 12) discloses a method where the host is able to make a request to refresh status information or not to refresh status information. When the status request is not a request for refresh status information the stored status information is sent. When the request is a request for refresh status information the system refreshes the status information with the newest status information and sends the newest status information to the host.**

LeCrone, Reichbauer, and Inamine are analogous art because they are all from the same field of endeavor, network computing.



At the time of the invention it would have been obvious to a person of ordinary skill in the art to implement the refresh status information request of Inamine in the network system of LeCrone and Reichbauer.

The motivation for doing so would have been to avoid low utilization of data.

**(Inamine: Column 1, Lines 61-64)**

Therefore it would have been obvious to combine the refresh status information request of Inamine in the network system of LeCrone and Reichbauer for the benefit of avoiding low utilization of data to obtain the invention as specified in claims 17.

24. **As per claim 18**, LeCrone, Reichbauer, and Inamine disclose in a computer system which includes a plurality of storage subsystems that are sequentially concatenated to a host computer and performs remote copy between said plurality of storage subsystems, a first storage subsystem comprising:

An interface which receives a status information acquisition command and which sends status information from and to a second storage subsystem that is located on a nearer side of the storage subsystem relative to the host computer and connected to the first storage subsystem,

An outgoing status information storage unit which stores said status information to be sent to said second storage subsystem,

A concatenation position judgment unit which judges a concatenation position of the first storage subsystem based on information stored in said status information acquisition command received from said second storage subsystem, and

A status information acquisition unit,

Wherein said status information acquisition unit acquires the status information of the first storage subsystem at status information acquisition time intervals stored in the status information acquisition command, to store the acquired status information into the outgoing status information storage unit, when said concatenation position judgment unit judges that the first storage subsystem is a storage subsystem located at a farthest position in concatenation order relative to the host computer, and

Wherein said status information acquisition unit acquires the status information of the storage subsystem at a time of receiving status information from a third storage subsystem connected to and located on a farther side of the storage subsystem relative to the host computer, and adds the status information of the first storage subsystem to the received status information of said third storage subsystem, to store resultant status information to the status information storage unit, and

Wherein when the concatenation position judgment unit judges that the storage subsystem in question is not a storage subsystem connected directly to the host computer, then, said interface sends all of said status information stored in the status information storage unit to said upstream storage subsystem.

**Claim 18 is rejected using the same rationale as claims 15 and 17 in addition to Inamine: Column 1, lines 58-60. Inamine teaches the acquisition of status information at predetermined regular time intervals. When the**

**acquisition occurs it will occur in the farthest storage subsystem at regular intervals.**

25. **As per claim 22**, LeCrone, Reichbauer, and Inamine disclose in a computer system which includes a plurality of storage subsystems being sequentially concatenated to a host computer and performs remote copy between said plurality of storage subsystems, a status information monitoring method for monitoring remote copy status of at least one of the storage subsystems sequentially concatenated to first storage subsystems directly coupled to a host computer, said status information monitoring method comprising the steps of:

Generating a status acquisition command for acquiring, at regular time intervals, remote copy status information of all the storage subsystems constituting a specific sequence connected to the host computer,

Sending the generated status acquisition command to the first storage subsystem,

Receiving the sent status acquisition command in the first storage subsystem,

When the received status acquisition command is a command for acquiring the status information of the sequence to which the first storage subsystem belongs, sending the status acquisition command to a second storage subsystem connected to the first storage subsystem,

Sending the received command at said second storage subsystem to a third storage subsystem connected at an end farthest from the host computer,

Acquiring said status information to be sent to the second storage subsystem connected to the third storage system,

According to the received status acquisition command, in the third storage system connected at the end;

Judging in the third storage subsystem, whether or not the storage subsystem is the first storage subsystem,

When it is judged that the storage subsystem is not the first storage subsystem, sending the status information of the third storage subsystem from the third storage subsystem to the second storage subsystem,

Receiving, in the second storage subsystem, the status information of the third storage subsystem,

Adding, in the second storage subsystem, the status information of the second storage subsystem to the received status information of the third storage subsystem'

Judging, in the second storage subsystem, whether or not the storage subsystem is the first storage subsystem,

When it is judged that the storage subsystem is not the first storage subsystem, sending the received status information of the third storage subsystem and the second storage subsystem from the second storage subsystem to the first storage subsystem,

Receiving, in the first storage subsystem, the status information of the third storage subsystem and the second storage subsystem,

Adding, in the first storage subsystem, the status information of the first storage subsystem to the received status information of the third storage subsystem and the second storage subsystem,

Judging, in the first storage subsystem, whether or not the storage subsystem is the first storage subsystem,

When it is judged that the storage subsystem is the first storage subsystem, holding resultant status information,

Generating, in the host computer, a status information acquisition command for acquiring remote copy status information of all the storage subsystems constituting a specific sequence connected to the host computer,

Sending, in the host computer, the generated status information acquisition command to said first storage subsystem,

Receiving, in the first storage subsystem, the sent status information acquisition command

Sending from the first storage subsystem, the resultant status information held by the first storage subsystem to the host computer when a sequence designated by said command as a sequence from which status information is to be acquired is a sequence to which the first storage subsystem belongs, and

Receiving the sent status information in the host computer.

**Claim 22 is rejected using the same rationale as claim 18. The status acquisition at regular time intervals occurs all throughout the system.**

26. **As per claim 24**, LeCrone, Reichbauer, and Inamine disclose a computer system comprising:

A host computer, and

A plurality of storage subsystems, which are sequentially concatenated to, said host computer and remote copy is performed between said plurality of storage subsystems,

Wherein a first storage subsystem comprises.

An interface, which receives a status information acquisition command and sends status information from and to a second storage subsystem that is located on a nearer side of the first storage subsystem seen from the host computer and connected to the first storage subsystem,

An outgoing status information storage unit which stores said status information to be sent to said second storage subsystem,

A concatenation position judgment unit which judges a concatenation position of the first storage subsystem based on information stored in said status information acquisition command received from said second storage subsystem, and

A status information acquisition unit which acquires status information of the first storage subsystem at status information acquisition time intervals stored in the status information acquisition command, to store the acquired status information into the outgoing status information storage unit, when said concatenation position judgment unit judges that the first storage subsystem is a storage subsystem located at a farthest position in concatenation order seen from the host computer

Art Unit: 2188

and acquires status information of the storage subsystem at a time of receiving status information from a third storage subsystem connected to and located on a farther side of the storage subsystem in question seen from the host computer, and which adds the status information of the first storage subsystem to the received status information of said third storage subsystem, to store resultant status information to the status information storage unit,

Wherein when the concatenation position judgment unit judges that the first storage subsystem is not a storage subsystem connected directly to the host computer, then said interface sends said status information stored in the status information storage unit to said upstream storage subsystem, and

Wherein said host computer comprises:

A status information acquisition command generation unit which generates a status information acquisition command,

A status information acquisition unit, which receives status information from said plurality of storage subsystems,

A status information holding unit which holds the status information acquired by said status information acquisition unit, and

A remote copy adjustment unit, which generates information for adjusting remote copy according to, said status information held in said status information holding unit.

**Claim 24 is rejected using the same rationale as claim 18 in combination with the same rationale as claim 19.**

***Relevant Art Cited By The Examiner***

27. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Gagne et al. (PCT WO 00/49500) discloses a concatenated remote copy system.

Marshak et al. (US Patent Application Pub. No. 2003/0093597) discloses a concatenated remote copy system as well.

Fukuzawa et al. (EP 0 869 438) discloses a data backup method for heterogeneous systems.

Kern et al. (U.S. Patent No. 6,484,187) discloses a remote copy system with status change monitoring.

Ainsworth et al. (U.S. Patent No. 6,974,391) discloses a method for sending status requests on a scheduled regular basis.

**Conclusion**

**a. STATUS OF CLAIMS IN THE APPLICATION**

28. The following is a summary of the treatment and status of all claims in the application as recommended by M.P.E.P. ' 707.07(i):

**a(2). CLAIMS NO LONGER IN THE APPLICATION**

29. Claims 1-12 were cancelled by the amendment dated March 15<sup>th</sup>, 2005.

**a(4). CLAIMS REJECTED IN THE APPLICATION**



Art Unit: 2188

30. Per the instant office action, claims 13-24 have received a first action on the merits and are subject of a first action non-final.

**b. DIRECTION OF FUTURE CORRESPONDENCES**


31. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael B. McFadden whose telephone number is (571)272-8013. The examiner can normally be reached on Monday-Friday 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Manorama Padmanabhan can be reached on (571)272-4210. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

**IMPORTANT NOTE**

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MBM

  
**PIERRE VITAL**  
**PRIMARY EXAMINER**